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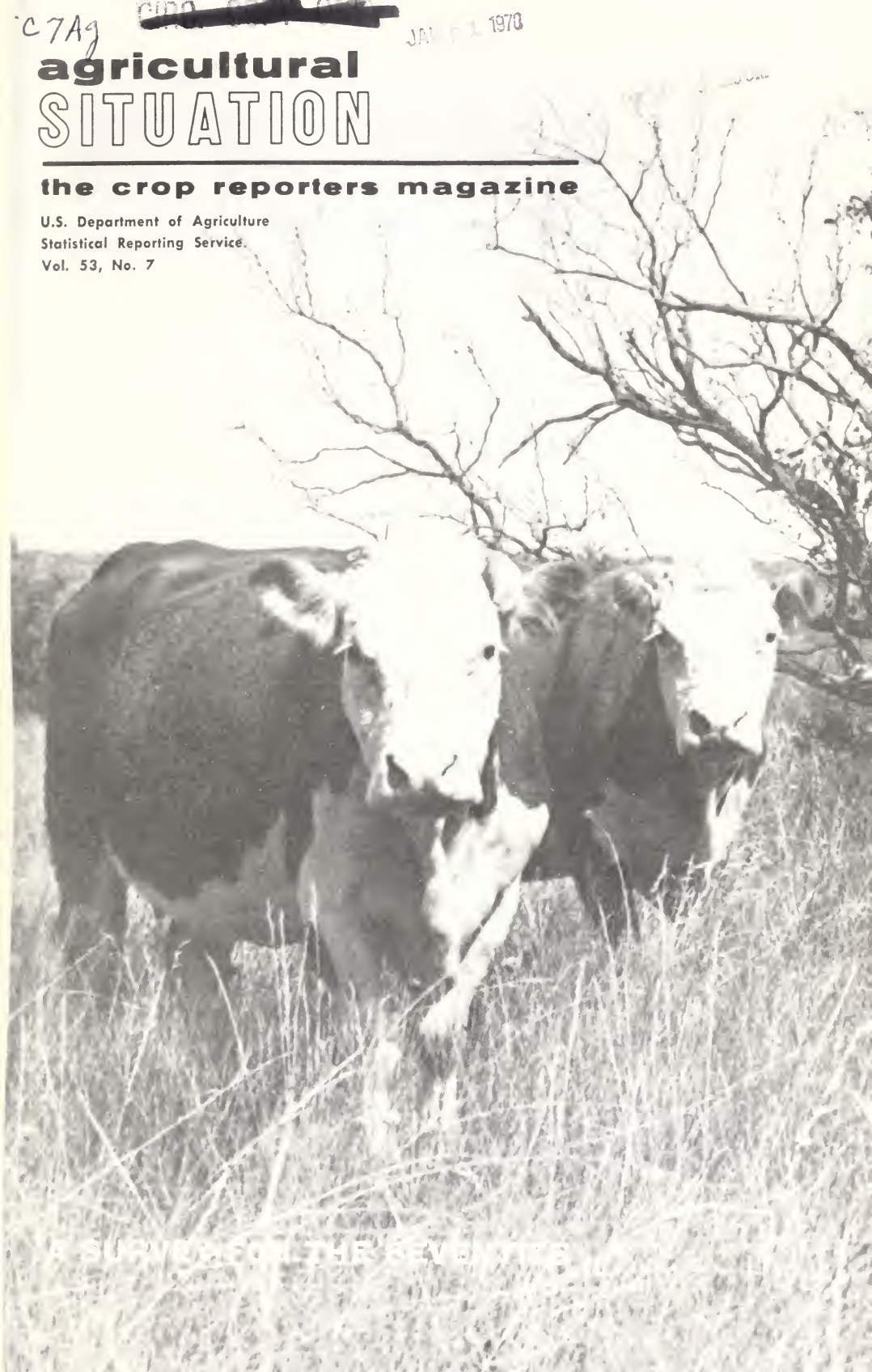
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JAN 1 1970

agricultural SITUATION

the crop reporters magazine

U.S. Department of Agriculture
Statistical Reporting Service
Vol. 53, No. 7



SURVEY FOR THE SEVENTIES



The Statistical Reporting Service (SRS) is developing an improved way to count livestock called multiple frame sampling. It is designed for tomorrow's conditions—fewer producers, but more cattle, sheep, hogs or poultry.

Multiple frame sampling promises:

- more complete coverage of the largest livestock operations,

- even greater estimate accuracy than now possible,

- and lower cost per unit of information gathered.

Already in limited use, it is incorporated into all livestock surveys in Texas, the Florida Cattle Inventory, hog estimates in five Corn Belt States, and sheep estimates in Tennessee. As more funds become available, it will be inaugurated for more surveys and States.

How It Works

Multiple frame sampling combines the advantages of two existing surveys. Mail questionnaires are used for economy and selectivity. A random sample based on land segments, involving personal visits to farmers, is used for its reliability and completeness. Used together, the two methods yield better information for a given cost than either used alone.

Mail questionnaires are sent to livestock producers selected from an extensive list kept by the State office of SRS. Data on returned questionnaires provide the first reference point for making livestock estimates.

A second reference point is needed, though, lists are seldom complete. How many animals are held by producers overlooked by the list? To find out, the State office adds a second data source—the enumerative survey.

The enumerative survey is now used primarily to assess planted acreage in June. Interviewers—called enumerators—visit farms located on randomly selected tracts of land. Since all types of agricultural operations are included in the tracts, enumerators interview a cross-section of livestock producers as well as crop farmers. Data are used from any producers who are not already on the mail questionnaire list.

From the mail and enumerative techniques, two estimates are made: (1) livestock held by producers on the State office list, and (2) livestock held by remaining producers. Added together, the estimates make a State total.

Florida Survey

Multiple frame sampling can be used for estimating all species of livestock. As an example, let's see how it helps Statistician-in-Charge Joe Mulin estimate Florida's cattle numbers each December.

A mail survey in early December accounts for most of the cattle.

The Florida Crop and Livestock Reporting Service in Orlando maintains a list of about 5,500 cattle producers. Although this is only a third of the State total, these producers account for about 85 percent of all cattle.

The list is stratified by approximate herd size, enabling statisticians to contact some producers in each group for a good cross-section. Cattlemen with large herds are contacted more frequently than others. Changes in the herd size in a few outfits can make a significant impact on Florida's cattle numbers.

It isn't necessary to contact all persons on the list. Mullin's statisticians will select only about 400 to receive questionnaires. But a complete response is needed from these producers. Those who don't mail back the survey will be contacted later by phone or personal visit. Based on the answers, the cattle numbers of all 5,500 producers will be estimated.

The enumerative survey, also conducted in early December, accounts for remaining cattle numbers.

Producers to be surveyed, however, were determined in June, when interviews with farmers on randomly selected land tracts yielded a sample of the State's livestock men.

The sample usually turns up some cattlemen already on the State office list. If they were interviewed in both parts of the multiple-frame survey, their livestock numbers would be counted twice. So duplications were eliminated following the June visits.

Although a simple comparison of names and addresses of persons in the list and land area frames eliminates most of the duplication, many cases are hard to spot. Methods of eliminating such cases are being developed in Washington by SRS researchers R. Paul Moore and Steve Williams.

After the Florida office has purged the enumerative survey of duplications, a sample of remaining livestock producers is drawn for interview in December. This visit yields estimates of cattle held by unlisted producers. When data from both surveys are in, Mullin finalizes his estimate of total cattle in Florida.

PROTEIN FOR PIGS

Don't feed your pigs more protein than needed at each stage of development. According to University of Minnesota research, feeding excess protein is just a waste of money.

Certainly, it's important to feed the minimum protein requirements. Stinting may mean slower growth and less meat. Here are the protein levels the Minnesota project recommends:

Newly Weaned Pigs. Boosting protein content of a dry diet to 20 or 24 percent, compared with 16 percent gives a better growth rate up to 50 pounds. But pigs fed on the 16 percent ration do just as well after that.

51-100 Pounds. Feeding a 16-percent protein ration here yields the best growth, most efficient use of feed, and thickest pork chops. Feeding less protein gives poorer results, while feeding more (19 percent in experiments) makes no improvement.

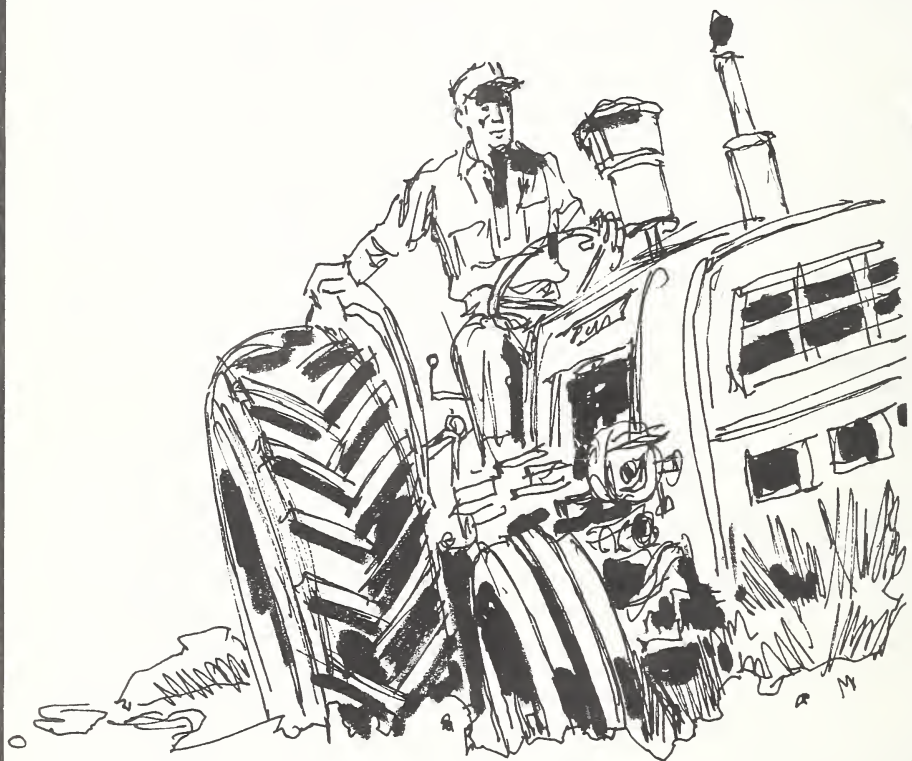
100-200 Pounds. Researchers recommend reducing the protein level for hogs in this weight range to 13 percent, since they don't seem to benefit from extra protein.

Gestating Gilts. In a controlled test, gilts did as well on an 8½ percent protein diet as those fed 14 to 19 percent during gestation. Prior to breeding, all gilts received a 15 percent diet of corn and soybean meal. At farrowing, they received 16 percent.

Also in favor of the 8½ percent ration: offspring of all groups were equally healthy, grew as fast, and yielded equally good carcass weights.

SEE PAGE 15 FOR FREE OFFER

**PROFILE
OF THE
TOP
FARMERS**



What does the profile of a farm with \$100,000 a year in marketings reveal? What kind of a man runs that farm?

On the average, the operator is middle-aged, well educated, lives on his farm and relies on it for most, or all, of his income.

A unit in the over-\$100,000 class is highly efficient, mechanized, and operated predominantly with hired labor.

Most often the interest of the farmer is in cotton, dairy, poultry, or livestock. These four types of farms accounted for more than half of all units topping \$100,000 in sales and just about half the farms with \$1 million or more.

A sketch of many operators heading large farms would probably show a broad-brimmed hat and cowboy boots.

And, with the predominance of the big farms in cotton, dairy, and especially livestock, it's not surprising to find 37 percent of all the large farms in the West. Western farms, including those producing other commodities, handled 53 percent of all farm marketings by units selling at least \$100,000. One-third of the largest farms were in the South with 24 percent of the marketings, and 31 percent in the North doing 12 percent of the total business.

The number of farms in the \$100,000-plus class increased 50 percent—from 20,000 to 31,000—between 1959 and 1964. Certainly, a major factor in this increase was the capability of the farmers. The educational level of these operators was higher than for those heading smaller farms. Some 17 percent in the top sales group had completed 4 years of college, compared with 7 percent of the operators selling \$20,000 to \$100,000, and 4 percent with sales under \$20,000.

Farms with sales of \$100,000 or more employed 40 percent of all hired labor on farms. But even at that, many of the largest farms are family operated, especially in the Corn Belt

and Lake States. In California, only 4 percent of all sales by the top units came from family farms, but in Iowa the share was 45 percent.

Across the field of agriculture between 1944 and 1964 technical and economic changes didn't seem to upset traditional land tenure patterns. For example, in those two decades about 55 percent of all land in farms remained under ownership operation, 35 percent was run by renters, and about 10 percent by paid managers. For farms with sales of \$100,000, slightly less land was under ownership and more under rental and paid management.

The importance of hired managers is most apparent for those farms with marketings between \$500,000 and \$1 million. The proportion of land under ownership was 46 percent, rental 30 percent, and paid managers 24 percent.

Operators of large farms are heavy investors. Purchased input per unit of output is much greater than on smaller farms. The big farms are rated more efficient judging by acres harvested per machine, yield per acre, and output per animal.

The 31,000 largest farms in 1964 accounted for 1 percent of all U.S. farms, but used 5 percent of all motor trucks on farms, 4 percent of the farm tractors, 14 percent of the crawler tractors, and 3 percent of the harvesters. More important than the numbers was their greater size and efficiency than those on smaller units.

Operating a large farm, it goes almost without saying, is a fulltime job. Only 16 percent of the operators of these big-sales farms reported any off-farm work, but 46 percent of those running other size farms had outside employment. The importance of other income declines as farm sales grow. For the 31,000 largest farms, outside income equaled 2 percent of marketings. Off-farm income was equal to nearly a fourth of sales on medium size farms (sales of \$5,000 to \$20,000), and over 200 percent on farms with sales \$5,000 or less.



WHY OUR GRAIN EXPORTS SLACKEN

Australia rushes to build storage for its 1969 grain crop. West Germany has taken to storing its recent surpluses in Denmark and Austria. These grain storage solutions—half a world apart—emphasize one fact: Grain crops have been good in many countries in the late 1960's.

While our grain exports have risen from the early 1960's average of \$2.1 billion a year (50 percent of which were commercial exports), recent exports have fallen from those of the middle 1960's, as this roundup of grain export values in recent years shows:

	<i>Billions</i>	<i>Percent commercial</i>
1965-----	\$2.6	60
1966-----	3.2	63
1967-----	2.6	68
1968-----	2.4	67

The 1969 value is expected to be less than 1968's, because of international surpluses.

Let's compare the grain picture of the past 2 years with the 1960-64 average, to see where all the grain is coming from.

United States: Record crop has trumped record crop for many of our grains during the past 5 years. During 1967 and 1968, U.S. production increases for all grains stood at 14 and 10 percent, respectively, over our 1960-64 per capita average. (According to the latest estimates from the Crop Reporting Board, our production of feed grains will be up slightly from 1968, and food grains will be down 7 percent.)

Other developed nations that usually have grains to sell, such as

Canada, Soviet Union, and France, averaged per capita grain crops 12 and 26 percent above their early 1960's average during the past two years.

High European Community subsidy rates, especially for French wheat, have encouraged European farmers to expand their grain output. These subsidies also enable the Western European nations to undercut competitors on the world market. These countries support their presently flourishing grain trades by taxing other sectors of their economies.

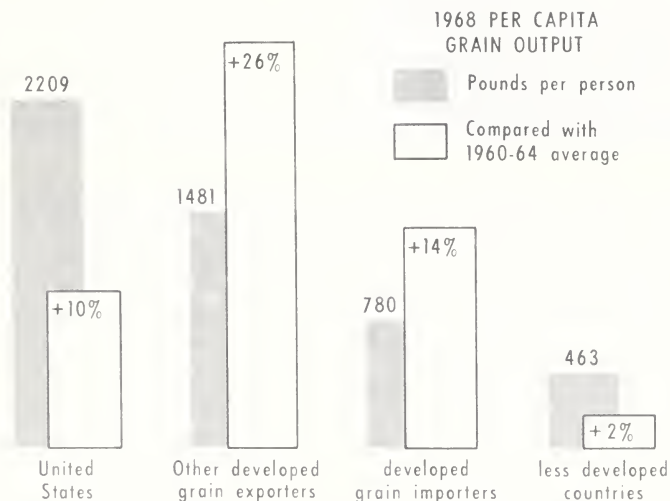
Customer countries with developed economies, such as Western Europe, excluding France, and Japan, have pushed their grain crops 14 percent per capita above the early 1960's level. Also, substitution of nongrain feeds to livestock has depressed grain demands in some of these countries—

despite their growing livestock industries. Western Europe and Japan are finding that urea, brewers waste, sugar, whole oilseeds, and byproducts of the food-canning industry make cheaper cattle and poultry feeds than imported grain.

Less developed nations have done a magnificent job of increasing grain production over the past decade. But still, because of population increases, their per capita gain was held to 2 percent above the 1960-64 average.

Some of these countries have more money than they had a decade ago. Their first priority for spending, in some cases, is a change in diet from starches to meats, eggs, and dairy products.

Livestock and poultry industries, gaining toe holds in some countries, are good outlets for U.S. grain but the competition is now rough.



INCREASING GRAIN OUTPUT means little unless it outpaces population growth. Thus, despite spectacular crops recently in less developed countries, chart above reveals only a 2-percent per capita gain in their grain output since 1960-64, while grain ration per person amounts to just 463 pounds. Meanwhile, industrialized countries like our own have boosted per capita output in excess of needs, glutting the international grain markets.



Don Scott Airfield near Columbus, Ohio, scene of the 1969 Farm Science Review. Seed demonstration plots, FOREGROUND, and a huge display of agricultural equipment were on view in the late September show. During equipment demonstrations, several hundred acres of crops on the Review grounds were harvested and plowed. Big tents held technological displays, including one by the Ohio Crop and Livestock Reporting Service.

SPOTLIGHT ON:

OHIO'S FARM SCIENCE REVIEW

"... A farm show ... an educational event ... science exhibit without the hoopla of a State Fair. A place to see new crop practices and farm equipment demonstrated." These are the enthusiastic comments of Dan Tucker, Statistician-In-Charge, Ohio Crop Reporting Service, about the unique Ohio State Farm Science Review.

The 7th Annual Review was staged on 300 farmland acres of Ohio State University near Columbus. Sponsors were the University's College of Agriculture and Home Economics, the Cooperative Extension Service, the Ohio

Agricultural Research and Development Center, and the Ohio Exposition Commission. Tucker, also on the College's Agricultural Economics staff, was pleased with the success of the Crop Reporting booth at the Review.

The booth was one of many commercial and educational displays housed in huge tents. More than 200 farm operators signed up for crop reports or as prospective volunteer crop reporters.

The Review, one of the largest in the Nation, featured \$4 million worth of farm machinery. Much



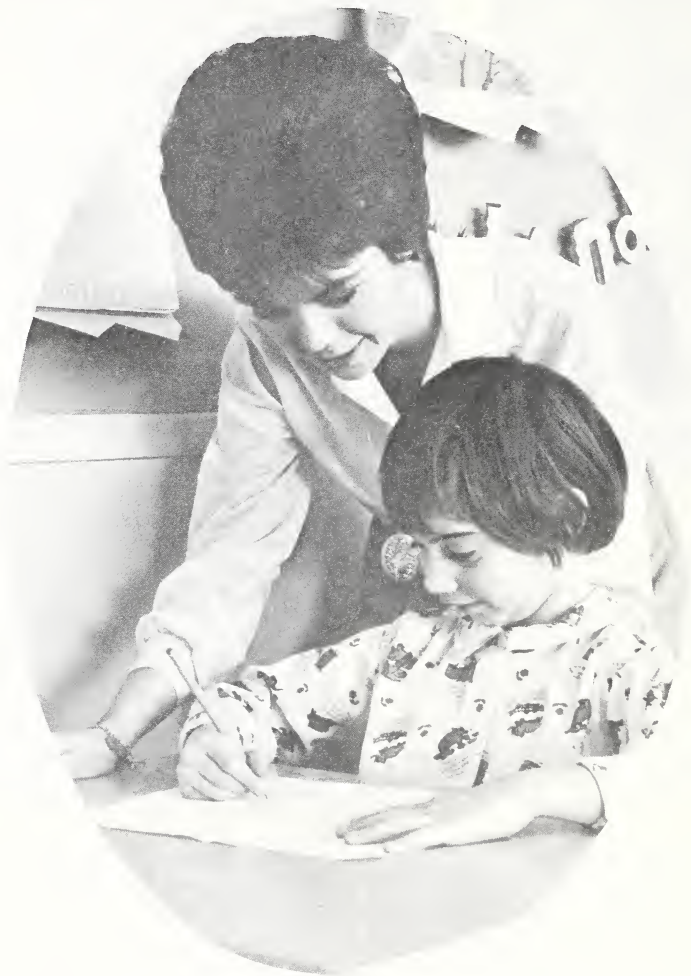
ABOVE: Crowd compares performance of tractors during the Review. ABOVE RIGHT: Visitors inspect some of the equipment on display. RIGHT: Demonstration plots at the Review were used during the summer by the Ohio Crop Reporting Service to train survey-takers. Enumerator at right examines corn he will sample in roped-off unit.

of it was demonstrated on test plots for the record 70,000 visitors. People also viewed recommended practices for field crops, horticulture, forestry, soil and water conservation projects, and even farm recreational developments.

"This year at the Review," Tucker reported, "seeds, especially hybrid corn, drew the interest of many visitors." Special plots displayed hybrid corn varieties in various stages of development: 283 hybrids in 40-inch rows; 144 in 30-inch rows; and 86 types in 20-inch rows.

Crop planting for the Review was staggered to allow observers the chance to see the crops at progressive stages of maturity. This practice has a side benefit that Tucker appreciates. He says it affords enumerators from his office a fine place to practice for the objective yield survey—an important part of the State and national crop estimating programs. The enumerators, who must make plant counts and measurements in selected fields of corn and soybeans, took accelerated courses in the test fields.

NEW MATH MEASURES SCHOOL SPENDING



Good teachers, good equipment, and good schools add up to a good education for the youngsters in your community . . . But they also add up to a lot of money.

To find out if schools have enough money to do a proper job, experts usually compute how many dollars are being spent for each student enrolled. On this yardstick, rural schools stack up

fairly well against city or suburban schools.

New USDA research, however, suggests that per-pupil spending may not be a good measure of school quality. So some rural schools may be below the quality their rank in spending suggests.

To find out how school financing really influences educational quality, a team of USDA researchers

measured spending in North Dakota school districts against pupils' scores on a standardized achievement test.

Their conclusion: higher spending per pupil did not produce higher test scores.

Higher test scores did occur, however, when more money was available for use in each classroom unit . . . call it per-teacher-spending. And the results were consistent among grades and among schools of different sizes.

Per-teacher spending is a better measure of school quality than per-pupil-spending. For one thing, differences in pupil-teacher ratios make per-pupil dollar differences misleading.

Per-teacher-spending eliminates this distortion by showing more clearly the level of teacher salaries (higher salaries attract better teachers to a given area) and allowances for books, audio-visual material, and other teaching aids available for each classroom of students.

The USDA researchers also found it was important to eliminate the cost of transportation from any spending figure. Since transportation doesn't contribute anything directly to the quality of education, schools with large transportation costs will appear to spend more if the figure is not taken out.

Suppose a rural school and an urban one are both spending \$10,000 on a classroom of 20 students.

But one school may have to spend \$4,000 of its money just on getting the students to and from school. That might leave only

\$5,000 for teacher salary and \$1,000 for books and teaching aids.

The urban school, spending only \$2,000 for transportation, could offer its teacher a \$6,500 salary and still have \$1,500 left for books and teaching aids. Thus, the urban school should be offering its students a better quality education.

Even without transportation differences, the per-pupil-spending figures can be misleading.

For example, say two schools are both spending \$10,000 on a classroom of students, with everything exactly equal except that one class has 20 pupils and the other has 25. One school will be spending \$400 per pupil, the other \$500. But how much difference will there be in the quality of the education?

Even stranger things happen to per-pupil-spending figures in small schools with a lot of variation in class size. A school with only 10 students in a class and high transportation expenses would spend a lot per student and have a very favorable pupil-teacher ratio—even with a low salaried, poorly-qualified teacher and not much in the way of teaching aids.

This USDA research suggests that per-teacher spending is a better measure of educational quality than per-pupil spending. Rural communities might well reassess the quality of their schools using this measure.

Some, especially those with average pupil-teacher ratios, may find that they are doing better than they had suspected. But others, especially those with only a few pupils per teacher, are likely to find that they had not been providing an adequate level of financial support for their schools.



Based on Information Available November 1, 1969

FARM INCOME PROSPECTS

For 1969, realized net farm income is running close to a \$16 billion rate, up substantially from \$14.8 billion last year. Livestock prices and cash receipts to producers are up sharply. Crop cash receipts are about the same.

With slightly larger livestock marketings and continued strong demand in prospect for first half 1970, livestock cash receipts likely will post a small gain over first half 1969. But with a smaller 1969 wheat crop and lower prices for soybeans, market receipts from crops will probably ease lower in early 1970.

Balancing these prospects against increasing production expenses, realized net farm income in the first half of 1970 may not match the \$15.6 billion rate of January-June 1969.

BUSINESS OUTLOOK

The U.S. economy is stepping lively as it enters 1970. Demand pressures continue strong, despite some cooling in defense orders and housing and slower advances in business investment. Wages are still rising briskly, employment remains at high levels, and prices have continued to advance.

Consumption and investment rates have moderated recently. In the new year, Federal Government plans to cut back on defense and construction spending and industry plans less rapid growth in new plant and equipment. Even so, outlays for consumer goods, including food and other farm products, will grow next year, due to rising wages, scheduled income tax reductions, and larger social security payments.

CATTLE FEEDING FUTURE

Continued growth in store for fed cattle output in the seventies. Beef cow herd will continue to grow, laying foundation for larger fed cattle numbers. Slaughter of other cattle will decline . . . Focus is swinging to West and Southwest. On October 1, there were 73 percent more cattle on feed in these 10 States compared with only 5 years ago.

1970 FED CATTLE GROWTH

Big fed cattle supplies headed for market this fall and winter. October–December marketings may be 12 percent over like period of 1968. Early 1970 marketings likely to be moderately larger than in early 1969, based on current feed-lot population.

Next year: Moderately larger fed cattle marketings expected. First half 1970 marketings will reflect a small increase in fall placements of cattle on feed . . . Gain in 1969 calf crop will supply feeders for larger second-half 1970 marketings. But increase won't match the projected 12-percent increase in marketings this fall.

1970 PRICES MAY RISE

This fall, smaller output of nonfed cattle, pork, veal, and lamb is partly offsetting larger fed cattle slaughter . . . Fed cattle prices were still above 1968 levels on November 1 . . . Prices will continue about the same through New Years.

Prices could pick up during first half 1970. Fed cattle supply increase will be modest, but consumer beef-buying ability and preference will remain strong . . . Warning: Some producers started to hold onto heavy cattle in early fall following summer price weakness. This could lead to top-heavy market if trend continues.

While the feeder cattle market weakened in the summer, prices this fall stayed well above a year earlier . . . Next year, as more cattle are fed, feeder demand will increase, and feeder cattle prices will stay well above average.

MEAT SUPPLY UPTREND

Total red meat supply declined this year . . . But will resume uptrend in 1970, with more fed beef and pork offsetting smaller output of veal, lamb, and nonfed cattle . . . Broiler output expanding also.

EGG UPTREND

Egg output through September was below 1968 level . . . Smaller laying flock responsible. Now, laying flock is getting larger with addition of higher yielding younger birds. So egg output in first half 1970 will be larger than in like period this year . . . Greater output will be partly offset by strong demand for liquid egg, tending to hold prices close to early 1969 levels.

MORE POULTRY PREDICTED

USDA experts forecast larger broiler and turkey output in first half 1970 . . . Broiler replacement flock has been

increasing recently, paving the way for increased output in first half 1970 . . . Economists foresee this action weakening prices next spring.

Early 1970 price outlook better for turkey producers . . . Big cold storage stocks are being worked down. Prices in October averaged 22½ cents a pound, versus 20½ January–September 1969, and should hold up through New Years . . . Hatch of poult for early 1970 markets is 3 percent higher than last year. More breeder hens being kept, too. So output will be up next spring, while cold storage stocks are down.

BIG CITRUS CROP

Florida's orange crop up a tenth to an expected 143 million boxes this season . . . Exceeds the 1966–67 record by a few million boxes . . . Other records, too: Temples, tangelos, and limes. Texas orange crop forecast up a fifth, but California's navel orange crop will be down, as will tangerine and grapefruit harvests. With record orange crop, larger pack of processed products—especially frozen concentrated orange juice—is likely . . . Prices for frozen orange juice will likely be lower in 1970.

DECIDUOUS FRUIT OUTPUT UP

Output of most deciduous items up this year, particularly apples . . . Total fruit pack is big, and frozen supplies above last year . . . Tree nut supplies also larger than last season. Lower than 1968 prices for noncitrus fruits that prevailed this summer are extending into fall.

TOP POTATO CROP

October estimates point to a new record for late summer and fall crop potatoes . . . Production increase to come from western States . . . Despite higher than 1968 prices in some areas, season average price is expected to be lower than last season.

FEWER TOMATOES

Smallest early fall tomato crop in many years expected . . . Fresh supply will be lower, and prices higher . . . But Mexican imports will supplement the domestic supply . . . U.S. processing crop will be off sharply: Growers cut acreage to offset record supplies of canned tomatoes and products. And yields will be down a tenth this year.

PLEASE NOTE: The next two issues of Agricultural Situation, Volume 54, nos. 1 and 2, will appear as a combined issue on February 1, 1970.—Ed.

FREE GARDEN GUIDE

SUBURBAN AND FARM VEGETABLE GARDENS



HOME AND GARDEN BULLETIN NO. 8
U.S. DEPARTMENT OF AGRICULTURE

Here's a 46-page illustrated booklet you shouldn't pass up.

This free guide has detailed sections on 61 various vegetables—from asparagus and eggplant to kohlrabi and watermelon. Instructions cover choosing a garden site, soil preparation, seed selection, proper tools, and planting practices.

Planning ahead could make your next garden your best. For your free copy of "Suburban and Farm Vegetable Gardens," tear off this page, which has your address on the back, and mail it in an envelope to:

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DECEMBER 1969

In This Issue

	Page
70's Survey.....	2
Top Farmers.....	4
Trade Trouble.....	6
Ohio Show.....	8
\$\$ for Schools.....	10
Outlook	12
Free Guide.....	15

AGRICULTURAL SITUATION

Distributed free to crop and livestock reporters in connection with their work.

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Raymond Bridge

The Agricultural Situation is a monthly publication of the Statistical Reporting Service, United States Department of Agriculture, Washington, D.C. 20250. The printing of this publication has been approved by the Bureau of the Budget (January 2, 1969). Single copy 10 cents, subscription price \$1 a year, foreign \$1.50, payable in check or money order to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

UNITED STATES
DEPARTMENT OF AGRICULTURE
STATISTICAL REPORTING SERVICE
WASHINGTON, D.C. 20250
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